

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) An image processing apparatus comprising:

a conversion means for generating a tone-converted image by converting luminance L_1 of pixels comprising a first input image based on a conversion function;

a reduced image generation means for generating a reduced image from the tone-converted image based on a logarithmic luminance $\log L(p)$ of a frame;

a smoothing means for generating a smoothed image having luminance L_c of pixels comprising the first input image based on an interpolation calculation using pixels comprising the reduced image; and

~~correction information acquisition means for acquiring correction information of the frame based on the reduced image; and~~

a grayscale conversion means for generating a contrast-corrected image based on luminance L_c of pixels comprising the first input image, luminance L_1 of pixels comprising the smoothed image, and a predetermined gain value g .

wherein gain value g is determined by an inverse number of a gradient of a tone curve, converting grayscale of the frame;

~~wherein the grayscale conversion means corrects contrast of the frame using the correction information, as a processing to be performed before and/or after the grayscale is converted.~~

2. (Canceled)

3. (Currently amended) The image processing apparatus according to claim 1, further comprising:

~~smoothing means for generating a smoothed image having luminance L_6 of pixels composing the frame smoothed based on interpolation calculation using pixels composing the reduced image; and~~

~~a gain value setting means for setting a the gain value g , used for correcting the contrast;~~

~~wherein the grayscale conversion means generates a contrast corrected image based on luminance L_6 of pixels composing the frame, luminance L_4 of pixels composing the smoothed image, and a predetermined gain value g ; and~~

the gain value setting means can be configured so as to set the gain value g based on input initial gain value g_0 , reference gain value 1, and an attenuation value $\text{attn}(Th_1, Th_2, L_c)$ calculated using a first luminance threshold value Th_1 , a second luminance threshold value Th_2 , and luminance L_c of pixels comprising composing the first input image frame.

4. (Currently amended) The image processing apparatus according to claim 1, further comprising:

~~conversion means for generating a tone converted image by converting luminance L of pixels composing the frame based on a conversion function;~~

~~smoothing means for generating a smoothed image by smoothing luminance L_6 of pixels composing the tone converted image; and~~

a gain value setting means for setting a the gain value g used for correcting the contrast based on an initial gain value g_0 which expresses an inverse $1/\gamma$ of a slope γ of the conversion function,]]

~~wherein the contrast correction means generates a contrast corrected image based on luminance L_c of pixels composing the tone converted image, luminance L_1 of pixels composing the smoothed image, and a gain value g ; and~~

the gain value setting means sets the gain value g based on ~~input~~ the initial gain value g_0 , a reference gain value 1, and an attenuation value $\text{attn}(Th_1, Th_2, L_c)$ calculated using a first luminance threshold value Th_1 , a second luminance threshold value Th_2 , and luminance L_c of pixels comprising ~~composing~~ the tone-converted image.

5. (Currently amended) The image processing apparatus according to claim 1, further comprising:

~~wherein the reduced image generation means generates a reduced image by converting the frame into a tone converted image based on a conversion function and reducing a size of the tone converted image;~~

the a correction information acquisition means for acquiring ~~acquires~~ correction information including a slope of the conversion function,; ~~and~~

wherein the grayscale conversion means generates the contrast-corrected image ~~corrects contrast of the tone converted image based on the reduced image and the slope of the conversion function.~~

6. (Canceled)

7. (Currently amended) The image processing apparatus according to claim 5, further comprising:

a hold means for holding the reduced image generated by the reduced image generation means and the correction information acquired by the correction means;

wherein the hold means holds the reduced image corresponding to a previous frame's the first input image and a slope of the conversion function applied to the previous frame's first input image, and the grayscale conversion means generates a contrast-corrected image of a second input image corrects the contrast of the tone-converted image based on the reduced image of the first input image previous frame and the slope of the conversion function applied to the first input image, both stored in the hold means.

8. (Currently amended) An image processing method comprising:

generating a tone-converted image by converting luminance L_1 of pixels comprising a first input image based on a conversion function;

generating a reduced image based on a logarithmic luminance $\log L(p)$ of the tone-converted image a frame;

generating a smoothed image having luminance L_c of pixels comprising the first input image based on an interpolation calculation using pixels comprising the reduced image;

acquiring a correction information of the frame based on the reduced image; and
generating a contrast-corrected image based on the correction information, luminance L_c of pixels comprising the first input image, luminance L_1 of pixels comprising the smoothed image, and a predetermined gain value g .

wherein gain value g is determined by an inverse number of a gradient of a tone curve.

~~converting grayscale of the frame;~~

~~wherein the grayscale conversion step corrects contrast of the frame using the correction information, as a processing to be performed before and/or after the grayscale is converted.~~

9. (New) The image processing apparatus according to claim 1, wherein the reduced image generation means generates the reduced image based on a logarithmic luminance $\log L(p)$ of the tone-converted image.

10. (New) An image processing apparatus comprising:

a conversion unit configured to generate a tone-converted image by converting luminance L_1 of pixels comprising a first input image based on a conversion function;

a reduced image generation unit configured to generate a reduced image from the tone-converted image;

a smoothing unit configured to generate a smoothed image having luminance L_c of pixels comprising the first input image based on an interpolation calculation using pixels comprising the reduced image; and

a grayscale conversion unit configured to generate a contrast-corrected image based on luminance L_c of pixels comprising the first input image, luminance L_1 of pixels comprising the smoothed image, and a predetermined gain value g ,

wherein gain value g is determined by an inverse number of a gradient of a tone curve.

11. (New) The image processing apparatus according to claim 10, wherein the reduced image generation unit is configured to generate the reduced image based on a logarithmic luminance $\log L(p)$ of the tone-converted image.